



# NH Dredge Task Force Meeting

Seabrook-Hampton Bridge Project  
Project No. 15904

February 6, 2019



Innovative Planning  
BETTER COMMUNITIES

# Agenda



- Project Background
- Project Purpose and Need
- Public Outreach
- Environmental and Cultural Resource Coordination
- Bridge Rehabilitation Study
- Alignment Study
- Next Steps

# Project Background



- NH Route 1A over Hampton Harbor
- Carries up to 18,000 vehicle per day during peak periods
- Recreational bicycle and pedestrian use
- Opens approximately 800 times per year for vessel movement in and out of Hampton Harbor

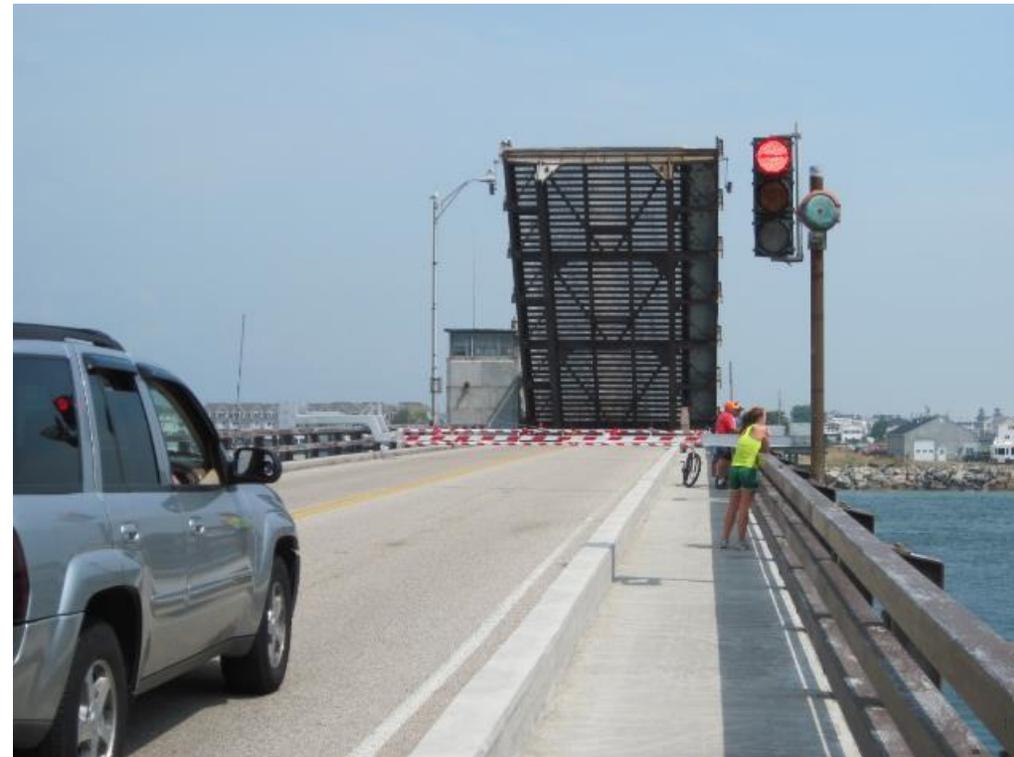


West Elevation

# Bridge History



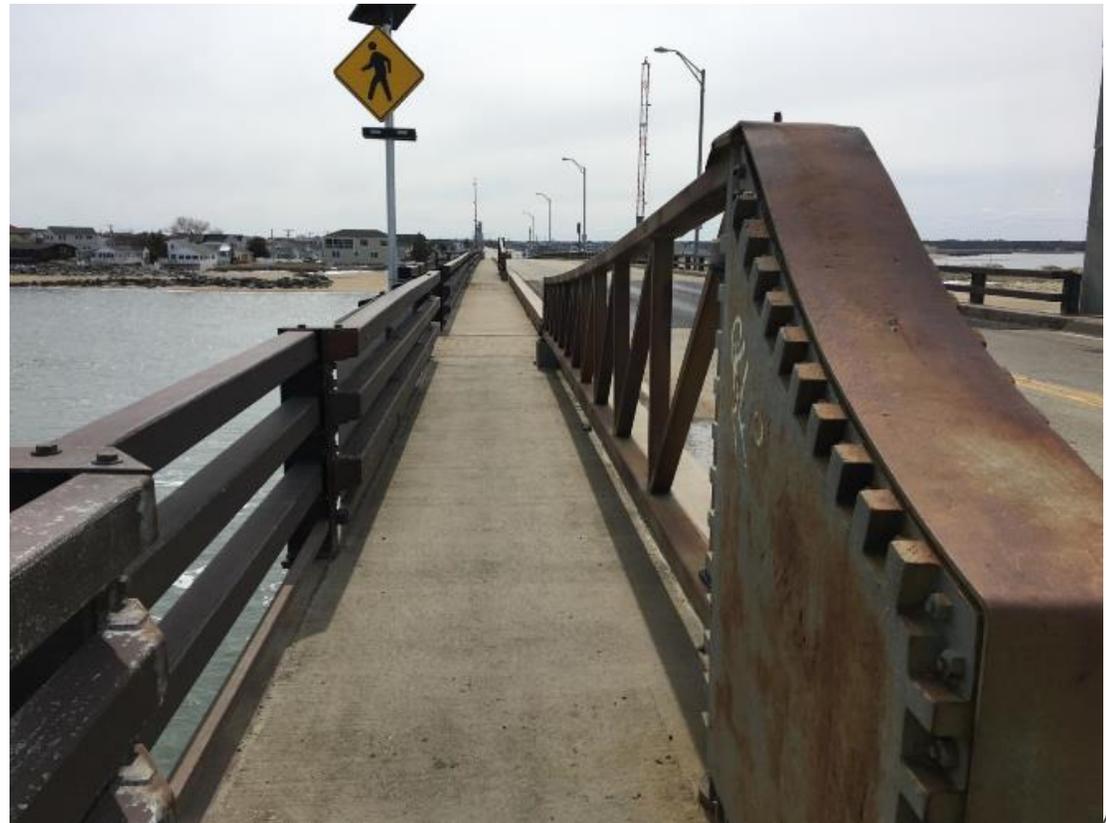
- Constructed in 1949
- One of two remaining bascule bridges in New Hampshire
- Overall Length: 1199'-0"
- Span Lengths: 12 fixed spans at 94 feet each and the 65-foot bascule span
- Overall Bridge Width: 33'-4"
- Roadway Width: 26'-0"  
(2 – 12'-0" Travel Lanes with 1'-0" shoulders)



Bascule span (open) looking North

# Narrow Sidewalk

- No shoulders for bicyclists
- 5-foot minimum shoulder width recommended for safe passage of bicyclists
- 1 – 4'-7" Sidewalk on east side (narrows to under 4 feet at barrier gates)
- 5'-6" minimum sidewalk needed to meet ADA requirements



Existing sidewalk at barrier gate

# Navigational Clearances

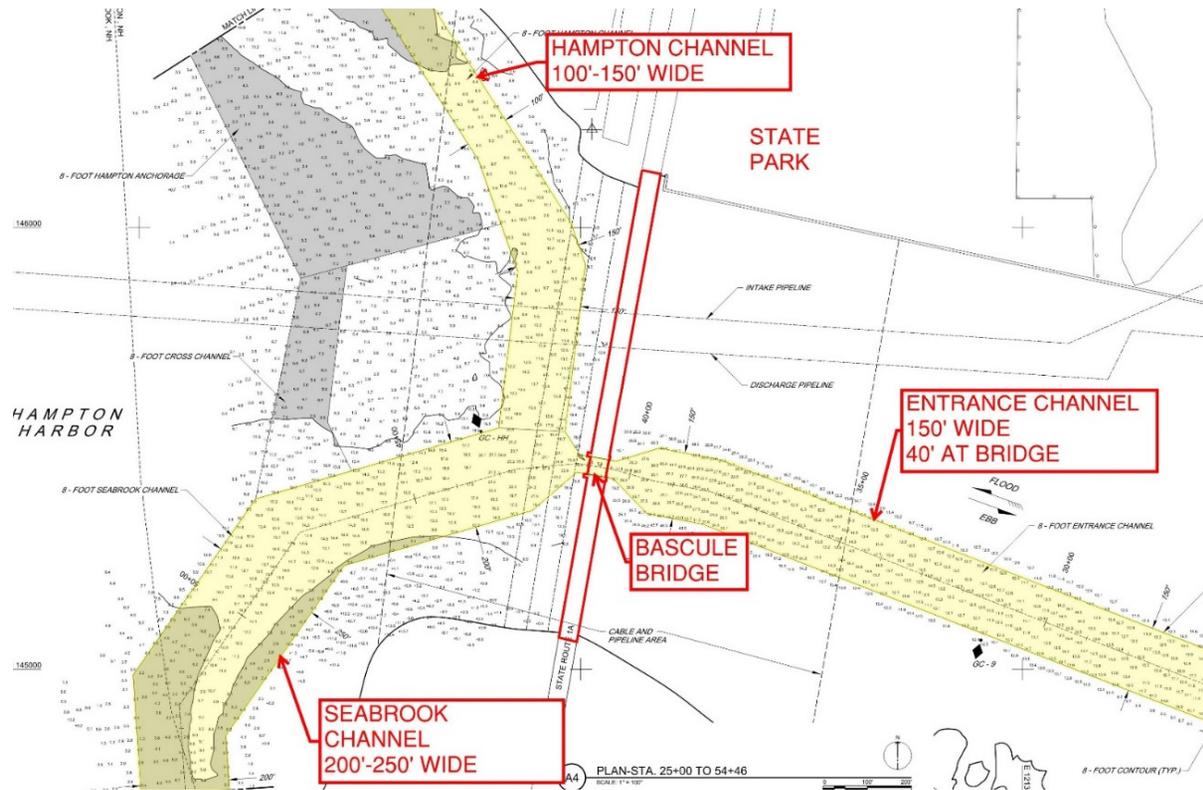


- Cannot clear of USACE owned dredge equipment
- Strong cross-currents make navigation challenging
- Width is significantly narrower than navigation channel.



Existing Navigational Clearances per Coast Surveys at Mean High Water

# Existing Navigation Channel



# Purpose and Need

## Purpose

- Provide a safe, reliable, and structurally sound crossing
- Improve mobility for the travelling public (vehicles, bicyclist, and pedestrians) and marine users

## Need

- Structurally deficient and functionally obsolete bridge
- Many original mechanical components and outdated electrical system
- Substandard shoulder and sidewalk widths



Deteriorated pinion and coupling, key elements of lift mechanism – Interim Repairs in 2018

# Project Alternatives



- Three major alternatives under consideration
  - ▶ Rehabilitation
  - ▶ Replacement with Fixed Bridge
  - ▶ Replacement with Movable Bridge
- Alignments east and west of the bridge will be considered for replacement structures and temporary bridge structures (if required)
- Various heights considered

# Key Considerations

- Vessel traffic and required clearance
- Right-of-way
- Driving public
- Pedestrians
- Bicyclists
- Historic resources
- Environmental resources
- Constructability
- Construction impacts and Traffic Control
- Utilities



Looking North

# Environmental Resources



Seabrook approach

- Initiated coordination with Natural Resource Agencies
- Completed field investigation for:
  - ▶ Wetlands
  - ▶ Habitat types
  - ▶ Listed plant species
  - ▶ Northern Long-eared bat
- Natural Resources Agency Coordination Meetings (August 2018 & January 2019)

# Cultural Resources



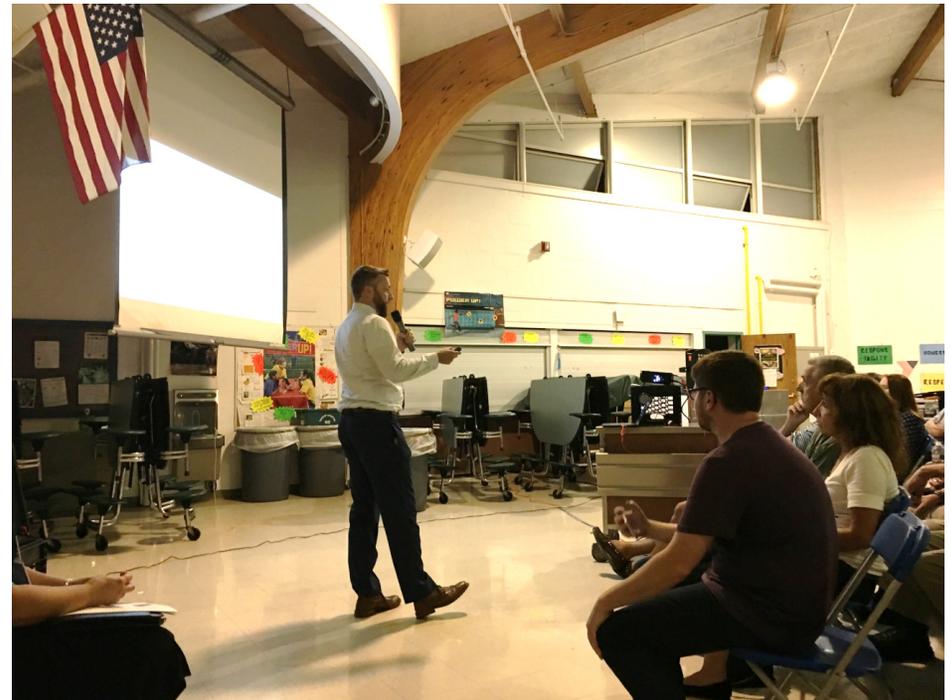
Bridge looking north

- Initial Cultural Resources Meeting (July 2018)
- Completed Phase 1A Archaeological Assessment
- Initiated historical resource identification
  - ▶ Completed Project Area Form
  - ▶ Individual Inventory Form for bridge
  - ▶ Four additional properties for further investigation
- Site walk with NH DHR and consulting parties (January 2019)

# Public Outreach



- Formed Public Advisory Committee
- Public Informational Meeting (September 26, 2018)
- Met with vessel users (October 2018)
- Three Project Advisory Committee meetings (July, November and December 2018)
- Met with abutters (December 2018)
- Public Informational Meeting (January 30, 2019)



First Public Information Meeting





# Bridge Rehabilitation Study

# Study of Rehabilitation Alternative



- Visual assessment and inspection of existing bridge
- Assessed rehabilitation for current capabilities, long term viability and for serving the purpose/need of project
- Requires significant modifications to carry current design loads, even without widening
- Insufficient capacity for widened roadway
- Geometry of bascule pier restricts ability to update mechanical systems



Typical Bridge Underside

# Study of Rehabilitation Alternative



- Two Rehabilitation Alternatives under consideration
  - ▶ Replacement of full superstructure to widen bridge
  - ▶ Second movable bridge
- Bridge would need to be modified to carry modern design loads
- Providing widened roadway to meet needs of travelling public requires replacement of the entire superstructure (all steel girders) and widening of piers

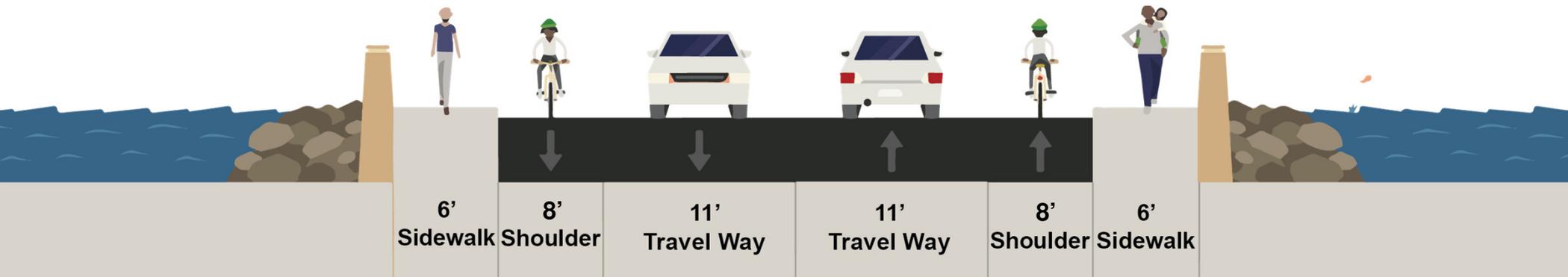


Bridge open to allow for vessel passage



# Alignment and Profile Study

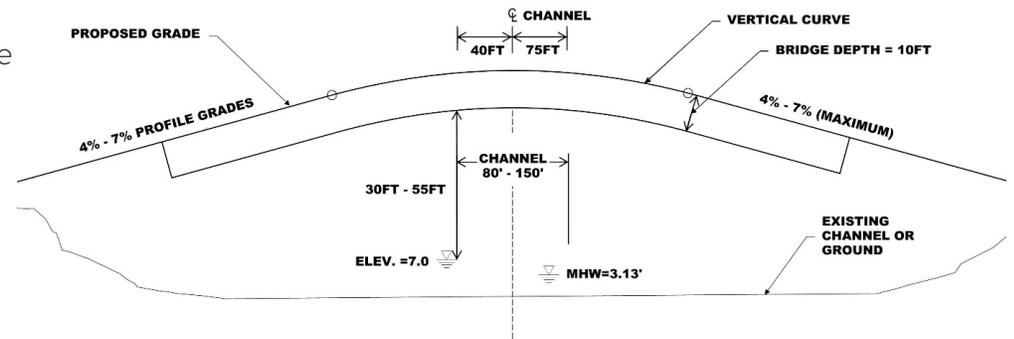
# Roadway Cross Section



# Key Variables



- Roadway slope
  - ▶ Steeper slopes reduce approach impacts and improve navigation
  - ▶ Flatter slopes improve vehicular, bicyclist and pedestrian access
- Vessel Navigation Clearances
  - ▶ Higher clearances improve navigation and reduce impacts to roadway traffic
  - ▶ Lower clearances reduce approach impacts
  - ▶ Sea Level Rise
- East vs West vs Existing Alignment
  - ▶ Impacts of both alignments must be considered
- Impacts on Roadway Approaches
  - ▶ Informs impacts to resources, right-of-way and facilities on approaches
- Constructability and Cost
  - ▶ Full cost estimates not developed at this stage, but qualitatively considered



Roadway Slope	Serviceability for Ped and Bike
3%-4%	Desirable for Pedestrians and Bicyclists
5%-6%	Acceptable Per Code Requirements
7% or More	Less Desirable

# Navigational Clearances



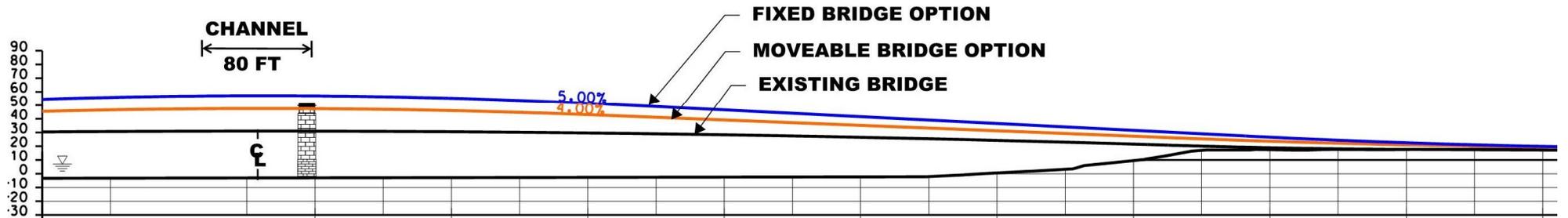
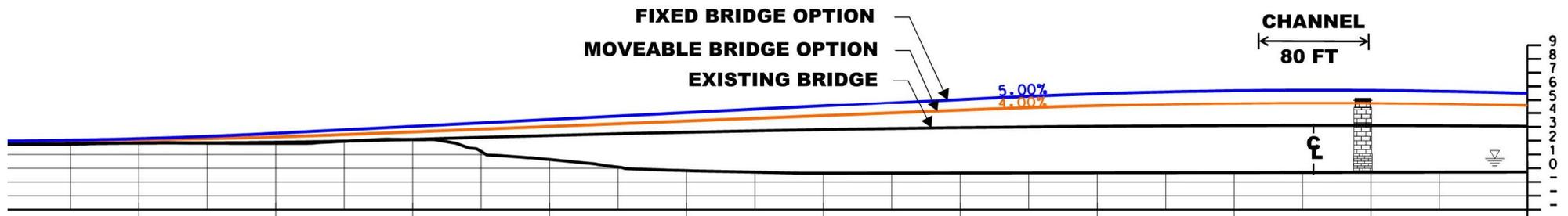
- Bascule Bridge
  - ▶ Proposed channel clearance: 80' Width, 34' Height with bridge in down position
- Fixed Bridge
  - ▶ Proposed channel clearance: 150' Width, 44' Height
  - ▶ 59' Height considered, not carried forward pending review by agencies
- Clearances include 3.9' Sea Level Rise
  - ▶ “Intermediate-High” range of estimated 2100 rise by NH Coastal Risk and Hazards Commission 2016 Report

Vertical Underclearance (from MHW)	Approx. Percentage of Lifts Eliminated
59'	Greater than 97%
44'	Greater than 90%
34'	Greater than 55%
18'	Current Clearance

MHW: Mean High Water

Note: Percentages listed are minimum passed based on available information. Percent of lifts eliminated may be higher as additional vessel user information becomes available.

# Navigational Vertical Clearance



# Bascule Bridge – 34' Clearance



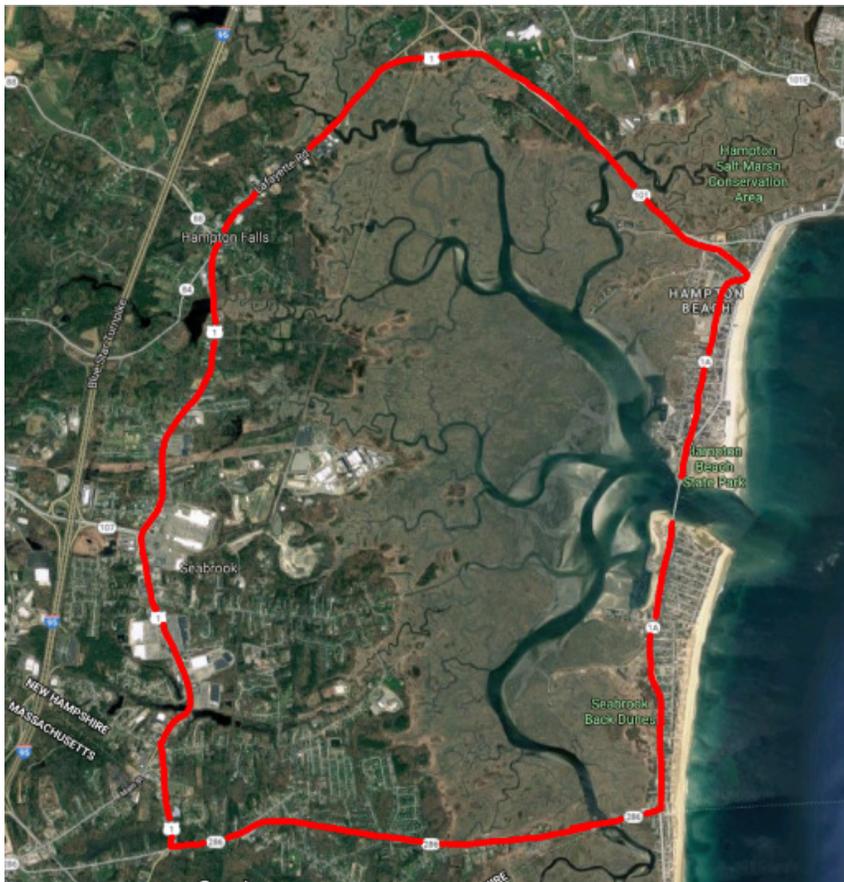
- Provides improved underclearance for vessels
  - ▶ Clears USACE dredging equipment
  - ▶ Reduces lifts by over 50% based on current usage
  - ▶ Does not provide full 150' horizontal clearance
- Bridge will be required to lift and will still affect traffic
- Provides desirable roadway grade – 4% slope
- Smallest Impact on Approaches
  - ▶ Low height increase at abutment: 5' +/-
- Costs
  - ▶ Bascule Bridge - significantly higher capital costs compared to a fixed bridge
  - ▶ Higher risk of costs associated with serviceability – system breakdowns can impact vehicular and vessel traffic
  - ▶ Increased life cycle costs associated with operating the bridge and maintaining mechanical/electrical systems

# Fixed Bridge – 44' Clearance



- Provides improved underclearance for vessels
  - ▶ Clears at least 90% of current lifts
  - ▶ Clears all regular users
  - ▶ Provides significant improvement for horizontal clearance – 150'
  - ▶ Clears USACE dredge equipment at low tide
- No bridge lifts required with fixed structure – no impact to roadway traffic
- Provides acceptable roadway grade – 5% slope
- Balances impacts on approaches
  - ▶ Height increase at abutment: 10'±
- Fixed Bridge - significantly reduced capital and life cycle costs compared to a bascule bridge
- Bridge can be designed to carry utilities across the harbor

# Horizontal Alignment - Online



Detour Map

- ▶ Full Closure w/ Regional Detour
  - Construction Schedule 2+ years depending on Environmental Restrictions
  - Required detour is approx. 12 miles
- ▶ Temporary Bridge Required
  - Increases Cost Significantly – on the order of \$20 million or more based similar project
  - Lengthens Construction Duration by 1 year or more for construction of temporary moveable bridge

# Eastern Alignment



# Western Alignment



# Summary of Alignment Impacts



West Alignment	East Alignment
Underwater and Underground Utilities	Underground Utilities
Hampton and Seabrook Channel	Entrance Channel
Beach usage at South Abutment	Beach usage at South Abutment
Sensitive Habitat / Conservation Area	Sensitive Habitat
Potential Impact to Businesses And Driveway	Impacts to State Park Entrance
	Impacts to homes on SE quadrant

# Bascule Bridge – West Alignment



Aerial of Existing Bridge

# Bascule Bridge – West Alignment



Aerial of Proposed Bascule Bridge

# Fixed Bridge – West Alignment



Aerial of Existing Bridge

# Fixed Bridge – West Alignment



Aerial of Proposed Fixed Bridge

# Next Steps



- Meet with NH Division of Historical Resources in February
- Continue to develop alternatives; Complete Type, Size and Location Study
- Ongoing meetings with Public Advisory Committee
- Continue coordination with US Coast Guard, US Army Corps of Engineers, other reviewing agencies
- Evaluate impacts/effects of all alternatives on range of natural and man-made resources
- Identify Preferred Alternative to carry into preliminary and final design phases
- Review study findings at Public Information meeting (summer 2019)

# Questions

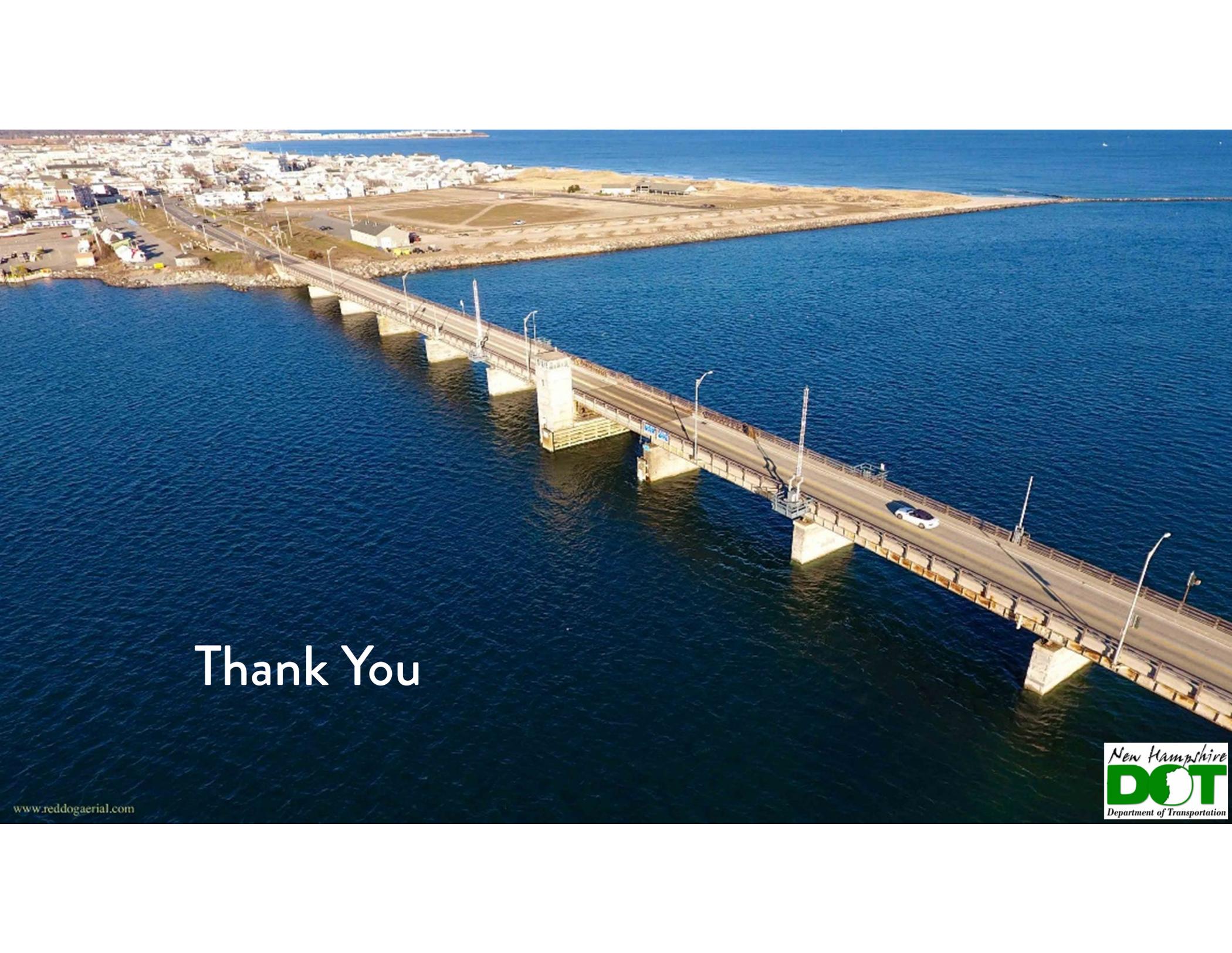


- Please ask any questions you may have regarding this presentation.



Bridge Looking West





Thank You

